

REMARKS

The Office Action of September 12, 2009 has been received and carefully considered. However, Applicant respectfully disagrees with Examiner's rejections. In this Amendment, Applicant has amended Claims 1, 3 and 9 to overcome the rejections and further specify the embodiments of the present invention. It is respectfully submitted that no new matter has been introduced by the amended claims. All claims are now present for examination and favorable reconsideration is respectfully requested in view of the preceding amendments and the following comments.

REJECTIONS UNDER 35 U.S.C. § 112 FIRST PARAGRAPH:

Claims 1, 3 and 9 have been rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement.

It is respectfully submitted that the rejections have been overcome by this amendment. Claims 1, 3 and 9 have been amended to delete the terms rejected by the Examiner.

Therefore, the rejection under 35 U.S.C. § 112, first paragraph, has been overcome. Accordingly, withdrawal of the rejections under 35 U.S.C. § 112, first paragraph, is respectfully requested.

REJECTIONS UNDER 35 U.S.C. § 102:

Claims 1, 3 and 9 have been rejected under 35 U.S.C. § 102 (b) as allegedly being anticipated by Yates (US Patent No. 3,650,783), hereinafter Yates and evidentiary evidence Sigma Aldrich.

Applicant traverses the rejection and respectfully submits that the presently claimed invention is not anticipated by the cited references. The Examiner has not

provided any reasoning on why Claim 3 was rejected under 35 U.S.C. § 102 (b). Thus, the rejection to Claim 3 is improper. The Examiner further alleges that Yates disclosed “at least 0.01% by weight of a water soluble salt” by using “sodium and potassium phosphate” as an example. It is respectfully submitted that Claim 1 of the present invention requires “at least 0.01% by weight of a water soluble salt to convert the trivalent or tetravalent cations to moieties that are unable to cause flocculation of the slurries.” The “sodium and potassium phosphate” in Yates do not satisfy the claim’s requirements. Further, Claim 9 requires “sodium or potassium hypophosphite.” The “sodium and potassium phosphate” of Yates does not anticipate “sodium or potassium hypophosphite” in Claim 9.

Yates teaches specifically a method to make colloidal silica sols coated with tri-**valent** phosphates such as aluminium, iron^{III} and chromium^{III} phosphate to be used in slurries to provide improved performance in certain applications, e.g. adhesion to rusty steel surfaces (see col. 6, lines 20 -- 23). It is well known that these coated colloids exhibit far greater stability at low pH values (<9) than do colloidal silica sols that are not thus coated.

Yates teaches specifically that the trivalent anion must be in solution. For this reason it requires the use of water soluble salts, such as the nitrates, chlorides or acetates of these metals, that are reacted with a water soluble phosphate, which can be the acid phosphate or even phosphoric acid (see Example 1), in order to coat the silica sol particles. It is most important that the Examiner understands that Yates teaches the coating of silica sol particles with phosphate made in this way is sufficiently pure (see col. 2, lines 27 – 30). Nowhere in Yates is the use of a tri-basic phosphate suggested.

Further, Yates teaches that the procedure should commence by the addition of phosphoric acid to a silica sol to which an alkali, e.g. ammonium hydroxide is subsequently added *to raise the pH to between 7 and 8*. Yates also recommends that alkali salt formed by the reaction between the water soluble trivalent salt and the added alkali be removed, e.g. by dialysis (see col. 3, lines 53 – 56). Nowhere in Yates is there any mention made of the destabilizing effect that minerals containing trivalent anions can

have on colloidal silica sols or any claim to the effect that the procedure described in Yates can allow colloidal dispersions based upon silica sols to be used with such minerals. In fact, Yates specifically implied that any residual water soluble phosphate be removed, e.g. by ion exchange (see col. 3, lines 45 – 48).

In contrast to Yates, the present invention teaches the use, among other things, that where a phosphate is employed, it should be added in the tribasic form so that the pH of the silica sol remains high. A 0.1 N solution of trisodium phosphate has a pH of approximately 12.0. In this way, the slurry is stabilized against the coagulant effect of tri-valent moieties on the surface of the mineral particles. It should also be noted that the use of a reducing agent, such as sodium phosphite or sodium hyposphosphite, has the function of counteracting the oxidation of divalent ferrous ions, which in the amounts present in solution from typical ferruginous minerals concentrations cannot destabilize silica sols by agglomeration or precipitation, to equivalent amounts of trivalent ferric ions, which can. In this way, the present invention again teaches that the method of stabilization is specifically that of eliminating dissolved trivalent ions from the vicinity of the silica sol, whereas the method of Yates introduces them.

It might be argued that this results in a de facto coating of the silica sol particles with the tri-valent moiety. However, this is incorrect for the following reasons:

1. Any trivalent moiety present on the surface of the mineral particles in the slurry will have a extremely low solubility product at the pH levels of >9.5 employed in the present invention. Thus, $\text{Fe}(\text{OH})_2$ which may be considered to be an active moiety on the surface of norite, ferrosferric oxide and other similar ferruginous minerals and which is rapidly oxidized in solution in the presence of air to $\text{FeO}(\text{OH})$ or $\text{Fe}(\text{OH})_3$, has a solubility of only 1.5mg per litre. This is far too little to provide a homogeneous coating of the phosphate around the ca. 30% weight% of silica sol particles in a typical silica sol binder.
2. Yates teaches specifically that, in order to coat silica sol particles with a trivalent phosphate, it is necessary to maintain the pH at between 7 and 8.

3. Yates claims that the content of trivalent phosphate in the silica sol binder must lie between 10% and 90% of the total sol content. In the present invention, Applicant uses at least 0.01% of stabilizer, e.g. tribasic phosphate and, in the examples, 2% and 4% by weight of mineral was provided. This is far less than 10% or more of the silica sol particles with a trivalent phosphate.

Therefore, the newly presented claims are not anticipated by prior art including Yates and the rejection under 35 U.S.C. § 102 (b) has been overcome. Accordingly, withdrawal of the rejection under 35 U.S.C. § 102 (b) is respectfully requested.

REJECTIONS UNDER 35 U.S.C. §103:

Claim 3 has been rejected under 35 U.S.C. §103 as allegedly being unpatentable over Yates in view of Bird et al. (US 4,655,276).

Applicant traverses the rejection and respectfully submits that the embodiments of present-claimed invention are not obvious over the cited prior art references. At first, it is respectfully submitted that there are significant differences between the embodiments of the present invention and the disclosures in Yates, as indicated above. In addition, it is respectfully submitted that the Examiner should not accept the statement that the use of a ferruginous mineral can impart microwave sensitivity to silica sol slurries. Such slurries are unstable and cannot be used for the purpose described. To the contrary, the present invention is directed to "stable slurry" that can achieve such purpose.

It is respectfully submitted that there is no motivation to combine Yates with Bird. Even if they are combined, they will not render the present claimed invention obvious. One of ordinary skill in the art would not discern the present invention as claimed at the time of its invention.

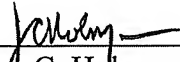
Therefore, the rejection under 35 U.S.C. §103 has been overcome. Accordingly, withdrawal of the rejections under 35 U.S.C. §103 is respectfully requested.

Having overcome all outstanding grounds of rejection, the application is now in condition for allowance, and prompt action toward that end is respectfully solicited.

Respectfully submitted,

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